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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. |
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09/295,022 04/20/99 ATHENS N 050506-1010

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PM92/0410

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| EXAMINER |
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| ART UNIT | PAPER NUMBER |
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3673

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DATE MAILED:

04/10/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/295,022

Applicant(s)

ATHENS ET AL

Examiner

John Kreck

Art Unit

3673

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

- 1) ☒ Responsive to communication(s) filed on 08 March 2000.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-53 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-53 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All b) ☐ Some * c) ☐ None of the CERTIFIED copies of the priority documents have been:
1. ☐ received.
2. ☐ received in Application No. (Series Code / Serial Number) _____.
3. ☐ received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

Attachment(s)

- 14) ☐ Notice of References Cited (PTO-892)
- 15) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 16) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 17) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 18) ☐ Notice of Informal Patent Application (PTO-152)
- 19) ☐ Other: _____.

Art Unit: 3673

DETAILED ACTION

The amendment dated 3/8/2000 has been entered.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 27, 31, 32, 49 and 50 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 27 recites "a product supply means for introducing a product..." (line 5) and "means for introducing said product..." (line 6). It is unclear whether these are the same means.

Claims 31 and 32 are also unclear regarding the introduction of catalyst and product. Regarding claim 32, is the product injection started and then stopped before the catalyst injection is started? Is the product injection started and continued while the catalyst is injected? Similarly, for claim 31; is the catalyst fully injected first?

Claims 49 and 50 are unclear regarding the steps of producing vacuum and allowing the product to react. It is unclear as to whether the product should be allowed to react completely before producing vacuum (claim 49) and whether the step of producing vacuum is completed before allowing the product to react (claim 50).

Art Unit: 3673

The amendment to these claims which substituted the word "implemented" for "done" does not make these claims any less indefinite. The applicant is requested to clarify the usage of this term in the claims, i.e. to point out whether this term is used to mean "fully completed" or "started", for example.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5, 7, 14-23, 26, 28, 29, 30-33, and 35-51 rejected under 35 U.S.C. 103(a) as being unpatentable over Land, et al. '974.

The Land reference teaches a soil and groundwater decontamination system for decontaminating a contaminated subsurface zone. The system of Land, et al. includes a product having the ability to react with subsurface contaminants and create a reaction end product and an injection well (16, 20) having a length being defined by a lateral wall. The injection well of Land, et al. is disposed in the contaminated subsurface zone and is configured to introduce the product into the contaminated zone. The Land, et al. system also includes another well (a vacuum extraction well) with a distal end disposed

Art Unit: 3673

in the contaminated zone. The Land, et al. system also includes a vacuum generating means which is deemed to be a vacuum pump.

Land, et al. also show a catalyst (see col. 2, lines 34-39 and col. 4, line 60 through col. 5, line 2) as called for in claims 2-4 and 29. Note that the limitations of claims 2-4 regarding the sequence of combining the product and catalyst are not given any weight as apparatus.

The Land, et al. reference also discloses a phase separator (see col. 7, lines 7-23 and lines 37-41).

The Land reference also discloses the distal end of the injection and extraction wells located in the vadose zone, at the groundwater level, or below the groundwater level (see the abstract) as called for in claims 14-22 and 36-44.

The Land reference also indicates that the product is an oxidizing agent (see abstract) as called for in claims 23 and 51.

The Land reference also shows the method of decontaminating a subsurface zone including the steps of introducing a product into the contaminated zone; allowing a reaction between the product and the contaminants; producing a vacuum in the well; and extracting the reaction end product from the subsurface zone.

The Land reference also shows that the amount of product injected can be variable (see, col. 11, lines 19 and 61) as called for in claim 35.

The Land reference also teaches the extraction of liquid and vapor as called for in claims 45-47 (see col. 7 lines 7-23 and lines 37-41).

Art Unit: 3673

The Land reference also teaches that the vacuum can be produced before, after or simultaneously with allowing the reaction (see claim 1 of Land (steps b and d) and claim 4 of Land for the order of injecting and applying vacuum (claims 48-50), also see col. 12, lines 31-47 where the vacuum is applied before the injection is started) as called for in claims 48-50.

The Land, et al. reference does not show that the vacuum extraction well has a casing and drop tube; nor does the Land reference show the steps of disposing a well casing or drop tube and extracting through the drop tube.

It is notoriously conventional in the art of wells to use well casings and drop tubes. Well casings and drop tubes are common features of modern well construction; used for example, to prevent the well from collapsing, and to control the point from which fluids are extracted.

It would have been obvious to one skilled in the art at the time of the invention to have substituted a vacuum extraction well with a casing and a drop tube for the vacuum extraction well of Land, et al. in order to prevent the well from collapsing and to control the point from which fluids are extracted.

The Land reference does not show the phase separator connected to a drop tube, but does indicate that the phase separator is used in conjunction with the vacuum extraction; therefore it would have been further obvious to have connected the phase separator to the drop tube, as called for in claim 5, in order to process the extracted products.

Art Unit: 3673

The Land reference does not explicitly disclose a fluid pump as called for in claim 7, however the Land reference does disclose that the injection can be done continuously, or in pulses. It is well known in the art of injection wells to use pumps to force fluid into a well. It would have been further obvious to one skilled in the art at the time of the invention to have used a pump in order to perform the injection

The Land reference does show the order of combining/injection of the catalyst and product. It is well known in the art of chemistry that catalysts can be added at any stage of a chemical reaction; that the catalyst can be added before the reactants are mixed; while the reactants are being mixed, or after the reactants are mixed. It would have been further obvious to one skilled in the art at the time of the invention to have combined the product and catalyst before, during, or after the injection; or to have injected the catalyst before, simultaneously with, or after the injection of the product as called for in claims 30-32. The order of combining and injection would have been an obvious matter of choice; based on the well known principle that a catalyst can be added at any point in a chemical reaction.

The Land reference also indicates that the vacuum extraction can be used to extract liquid and gas (see col. 7, lines 7-23 and lines 37-41); and does teach the use of phase separation; but does not specify whether they can be extracted simultaneously in a common stream and separated. It is apparent that the volatility of the extracted products (and hence whether they are liquid or gas) is dependent upon the chemical nature of the contaminants and atmospheric conditions. It would have been further

Art Unit: 3673

obvious to one skilled in the art at the time of the invention to have separated gas and liquid being extracted simultaneously in a common stream as called for in claim 33.

This would have been a common result of environmental factors.

Claims 6, 13 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Land, et al. in view of Hess, et al. '676.

The Land reference (as modified above) shows all of the limitations of these claims with the exception of the filter and the drop tube having an opening in the lateral wall. The Land reference does teach the desirability of treatment with activated carbon (col. 7, lines 19-22); but the reference does not disclose how this should be carried out.

The Hess reference shows a similar soil contaminant treatment system that incorporated a carbon filter to treat the extracted products.

It would have been further obvious to one skilled in the art at the time of the invention to have added a filter to the system of Land, et al. (as modified above) to treat the extracted products. The carbon filter of Hess contains the activated carbon desired by Land, and would have provided it in a convenient form.

Regarding the drop tube, it is notoriously conventional in the art of wells to provide tubes with openings, as evidenced by Hess, et al.

It would have been further obvious to one skilled in the art at the time of the invention to have provided a drop tube with an opening as taught by Hess, et al. in the system of Land, et al. (as modified above), the opening in the wall of the drop tube

Art Unit: 3673

would have allowed the extraction of reaction end products from any desired location in the well.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Land, et al '974 in view of Williams, et al. '505.

The Land reference (as modified above) shows all of the limitations of claim 8, with the exception of the air supply valve.

The Williams reference teaches the use of an air supply valve (45) in conjunction with a similar vacuum extraction well to provide air injection to apply heat to the extracted products.

It would have been further obvious to one skilled in the art at the time of the invention to have added the air injection system of Williams, including the air supply valve, to the vacuum extraction well of Land, et al (as modified above) in order to provide for heating of the extracted products.

Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Land, et al '974 in view of Nelson, et al. '700; or Dela '250; or Devlin '550.

The Land reference (as modified above) shows all of the limitations of these claims with the exception of the screen or perforations in the injection well.

It is notoriously conventional in the well art to provide perforations or screens to prevent clogging of the well or to provide for injection or extraction over a range of

Art Unit: 3673

depth. Also, Nelson, et al. '700; Dela '250; and Devlin '550 show the use of screens or perforations in injection wells.

It would have been further obvious to one skilled in the art at the time of the invention to have provided perforations or a screen in the injection well of the Land reference (as modified above) to provide for injection or extraction over a range of depth and to prevent clogging.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Land, et al. '974 in view of Braithwaite, et al. '888.

The Land reference (as modified above) shows all of the limitations of claim 11, with the exception of the closed end of the well casing.

The Braithwaite reference shows a similar injection/extraction well system in which the well casings are provided with closed ends to assist in driving the casings into the ground.

It would have been further obvious to one skilled in the art at the time of the invention to have closed the end of the well casing of the Land invention (as modified above) to assist in driving the casings into the ground.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Land, et al. '974 in view of Hajali, et al. '764.

Art Unit: 3673

The Land reference (as modified above) shows all of the limitations of claim 12 with the exception of the drop tube having an open end.

It is well known to use drop tubes with open ends in extraction wells; as taught by Hajali, et al. in order to extract products from the bottom of the drop tube.

It would have been further obvious to one skilled in the art at the time of the invention to have used a drop tube with an open end with the invention of Land, et al. (as modified above), in order to extract products from the bottom of the drop tube.

Claims 24, 25, 52, and 53 rejected under 35 U.S.C. 103(a) as being unpatentable over Land, et al. '974 in view of Vigneri '141.

The Land reference (as modified above) shows all of the limitations of these claims with the exceptions of the surfactant and co-solvent.

Vigneri teaches the use of surfactant in a similar system (see col. 64-65). (Note also that Vigneri shows the use of valves and pumps and the pre-injection of catalyst as known in the art).

It would have been further obvious to one skilled in the art at the time of the invention to have used a surfactant in the invention of Land, et al. (as modified) in the manner of Vigneri in order to improve the properties of the product.

Co-solvents are well known in the art for their ability to improve the properties of surfactants.

Art Unit: 3673

It would have been further obvious to one skilled in the art to have added a co-solvent; it is well known in the art that co-solvents can be used to enhance the properties of surfactants.

Allowable Subject Matter

Claim 27 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

Response to Arguments

In response to applicant's arguments, the rejection under 35 USC 102 has been dropped. The Land reference does not disclose a well with a casing and drop tube.

Applicant's arguments concerning the obviousness rejections have been fully considered but they are not persuasive. The applicant has indicated that the examiner did not make a prima facie case of obviousness; but the applicant has not made any substantive arguments to refute the examiners statement of obviousness from the first office action:

"alternatively, it would have been obvious to one skilled in the art at the time of the invention to have used a casing and a drop tube (as called for in claim 28). Both well casings and drop tubes are common features of modern well construction; used for example, to prevent the well from collapsing, and to control the point from which fluids are extracted."

Art Unit: 3673

These well-known features of modern wells are also shown in some of the cited prior art. Some examples of similar vacuum extraction wells associated with decontamination systems include Hess, et al. (US Pat. 5,050,676); Williams, et al. (US Pat. 5,709,505); Hajali, et al. (US Pat. 5,172,764); and EPA 510-B-94-003. These references all show vacuum extraction wells with well casings and drop tubes.

It is clear that a case for obviousness has been made in the first action; and lacking any substantive arguments the obviousness rejections stand. Mere allegations of a lack of obviousness are not persuasive.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., a dual-conduit extraction well) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Art Unit: 3673

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Kreck whose telephone number is (703)308-2725. The examiner can normally be reached on 6:00-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eileen Lillis can be reached on (703)308-3248. The fax phone numbers for the organization where this application or proceeding is assigned are (703)305-3597 and (703)305-7687.

Art Unit: 3673

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)306-4177.

JJK
March 30, 2000

A handwritten signature in cursive script, appearing to read "Eileen Lillis".

Eileen Lillis
Supervisory Patent Examiner